

A growing concern

Rising obesity means that more children are developing non-alcoholic fatty liver disease.

BY BIANCA NOGRADY

When a condition commonly associated with a lifetime of alcohol abuse — severe scarring of the liver, or cirrhosis — starts to show up in children as young as eight, something is very wrong.

"I had a teenage patient, who wasn't even being evaluated for liver disease but was getting surgery for weight loss, and was incidentally found to have cirrhosis," says Jennifer Woo Baidal, a paediatric gastroenterologist at Columbia University Medical Center in New York.

Imagine a person with cirrhosis of the liver. Chances are that the image conjured will be of an adult who drinks too much or someone who is infected with a hepatitis virus. But the obesity epidemic is changing that perception.

Paediatricians worldwide are seeing an increasing number of children and adolescents — the majority of whom are overweight or obese — with non-alcoholic fatty liver disease (NAFLD), as well as its more serious sequela non-alcoholic steatohepatitis (NASH), in which the liver becomes inflamed. More alarmingly, some young people are presenting with signs of scarring on the liver — known as fibrosis — and in others, the condition has progressed to the irreversible cirrhosis.

"It took some time for the general public and even paediatricians to realize that obesity during childhood has associated liver complications," Woo Baidal says. But with NAFLD now the most common cause of liver disease in children in the United States — overtaking viral hepatitis, congenital disorders such as biliary atresia, and inherited conditions such as Wilson's disease — and one of the most common worldwide, that realization has set in.

An estimated 7.6% of children and adolescents worldwide have some form of fatty liver disease. In the United States, the suspected prevalence of NAFLD in young people rose from 3.9% in the period between 1988 and 1994 to 10.7% between 2007 and 2010.

Around one-third of children with NAFLD share a pattern of the condition not seen in adults, says Joel Lavine, a paediatrician at Columbia University Medical Center. Their livers tend to have more fat and inflammation



Obesity is fuelling a rise in a liver condition once found only in adults.

around the portal tracts, as opposed to the lobes, and show fewer signs of cellular injury. Children with this particular form of NAFLD are often pre-pubescent and younger than those with the more common type of NAFLD. It is also more common in those of Hispanic ethnicity and in boys.

They also tend to show more of the fibrosis and cirrhosis that heralds more serious disease, in comparison to children without the pattern.

"So it's not just like this is a little kid thing and it doesn't matter; it will go away," Lavine says. "This is something that very early has worrisome features compared to adult disease or those with an adult-type pattern."

A big question concerns the longer-term health consequences of the increasing prevalence of NAFLD and NASH in children, says paediatrician Jake Mann at the University of Cambridge, UK. Although in adults a clear path can be traced from fat deposition in the liver (steatosis) to inflammation, scarring and then liver failure and transplant, the same path in children and adolescents is less well understood.

"We know that there are some children who will have significant fibrosis as if they were adults, but the majority of children with fatty liver disease probably do just have simple steatosis, which is thought to be a more reversible condition," he says.

Mann says that, to his knowledge, there has not yet been a case of NAFLD in a child or adolescent that has progressed so far as to require a liver transplant. "The feeling is that, even at its

worst, it would progress over twenty years, probably," he says. "The way I think about it is: we're doing our job to help ease the burden on the adult hepatologists."

That job is to identify children with NAFLD and to stop it before it progresses, which is challenging for a condition that is usually symptomless until it becomes severe.

Ethnicity seems to play an important part; the risk of developing NAFLD is particularly high in children with Hispanic, South Asian or Native American backgrounds. And certain genes, including some that influence liver function and the accumulation of fat in the liver, have been implicated in an increased risk of NAFLD. But paediatric gastroenterologist Valerio Nobili, at the Bambino Gesù Paediatric Hospital

in Rome, proposes that all overweight or obese children should be screened for NAFLD to identify the condition while there is still time to address it.

"Strategic in this fight against NAFLD is to persuade all the operators about the dangerousness of this condition, and about the need to act as soon as possible before the disease becomes irreversible," Nobili says. At that stage, the options for treating NAFLD in children are much the same as in adults: weight loss and lifestyle change. However,

says Woo Baidal, getting a growing child to simply maintain their weight can be easier than trying to get a fully-grown adult to lose weight. There are few interventional trials of drug-based treatments for NAFLD performed in children.

Nobili says that vitamin E, omega-3 fatty acids and the diabetes drug metformin have all shown some minimal effects in clinical trials, but the results so far are "unsatisfactory". Yet thanks to the renewed focus on NAFLD in children, he remains optimistic. "The attention on the paediatric NAFLD problem is today so high," he says, "that I remain confident about important progress during the next years." ■

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